Motion Imagery Standards Board **Recommended Practice** **MISB Profile for Aerial Surveillance and Photogrammetry Applications (ASPA)**	**MISB RP 0301.3** **Version 1.3** 9 April 2008

1 Scope

This Recommended Practice documents the DoD/IC/NSGI Motion Imagery Standards Board (MISB) standard profile for the Advanced Authoring Format (AAF) and the Material eXchange Format (MXF). The profile constrains the contents of AAF and MXF files to those in accordance with the Motion Imagery Standards Profile (MISP) currently in version 4.2.

The purpose of this document is to state DoD/IC/NSGI participant's requirements for AAF and MXF files to address specific operational needs and to form the basis for development of an AAF Implementation Guideline (IG) submitted to the AAF Association for approval as part of the AAF standard suite.

V1.3a includes Large Volume Streaming Data (LVSD).

2 References

SMPTE 336M-2001, *Data Encoding Protocol Using Key-Length-Value*

SMPTE 335M-2001, *Metadata Dictionary Structure*

SMPTE RP210.9-2004, *Metadata Dictionary*

SMPTE 377M-2004, *Material Exchange Format (MXF) File Format Specification (Standard)*.

SMPTE RP217-2002, *Nonsynchronized Mapping of KLV Packets Into MPEG-2 Systems Streams*

SMPTE 395M-2003, *Groups Registry Structure*

SMPTE RP-2009 *Groups Registry* (DRAFT)

SMPTE 400M-2003 *Labels Registry Structure*

SMPTE RP224.7-2004 *Labels Registry*

MISB *Motion Imagery Standards Profile (MISP),* V 4.2

NGA D&R IDM Rev E-2004

NGA D&R IDM D&R IDM Revision H (Final) (10/31/2005).

MISB RP 0101, Use *of MPEG-2 System Streams in Motion Imagery*, 28 February 2001

MISB RP 0102.2, *Security Metadata Sets for Digital Motion Imagery*, 20 November 2003

MISB RP 0103.1, *Timing Reconciliation Metadata Set for Digital Motion Imagery*, 11 October 2001

MISB EG 0104.3, *Predator Metadata Sets*, (Draft)

MISB EG 0602, *MISB Metadata Registry and Processes*, (Draft)

MISB RP 0107, *Bit and Byte Order for Metadata in Motion Imagery Files and Streams*, 11 October, 2001

MISB RP 0608.1, *Motion Imagery Identifier (MIID),* 27 August 2007

ITU-T Rec H.222 | ISO/IEC 13818-1:2000 / Amendment 1: *Carriage of metadata over ITU-T Rec H.222.0 | ISO/IEC 13818-1 streams*, March 2003 (DRAFT)

AAF Association, *AAF Specification V1. 1*, November 2004

AAF Association, *AAF Specification V1.0.1*, December 2003 (bibliographic only: V1.1 is normative)

SMPTE 381M-2004, *Mapping MPEG Essence Data to the MXF Generic Container*

SMPTE EG42-2004, *MXF Descriptive Metadata*

MIL-STD-2500B, *National Imagery Transmission Format (NITF)* Version 2.1 w/notices 1 and 2

STDI-0001, *National Support Data Extensions (SDE) for the National Imagery Transmission Format (NITF)*, Version 1.3, 2 October 1998

STDI-0002, *Compendium of Controlled Extensions (CE) for the National Imagery Transmission Format (NITF)* Version 2.1, 16 November 2000

DCGS-I 1.2, *Tactical Image ID TRE Specification*, May 2003

3 Introduction

The Advanced Authoring Format (AAF) is a multimedia file format developed to promote file-level interoperability across different platforms in the digital cinema and television industry. While AAF was designed initially for the entertainment industry, the parallels between their digital production, post-production, archiving, and product distribution processes using AAF and those needed for digital motion imagery in the DoD and Intelligence Community are remarkable.

The Material eXchange Format (MXF) (SMPTE 377M) is a multimedia file format for the exchange of program material between file servers, but it is also for tape streamers and digital archives. It usually contains one complete program, but this may comprise a sequence of clips and program segments. The 'body' is a stream-based multimedia container, which contains a sequence of frames where each frame comprises audio, video and data essence plus frame-based metadata. AAF and MXF are interoperable because they share the same object model and the same method of defining essence

The proposed AAF Profile for Aerial Surveillance and Photogrammetry Applications (ASPA) forms the basis for development of a prototype demonstration of the AAF format in the NGA Image Product Library (IPL). Following the prototype "AAF-in-IPL" demonstration, the AAF ASPA Profile can be used by the DoD/IC/NSGI community to specify standardized commercial off-the-shelf (SCOTS) products for motion imagery processing, exploitation, archive, and distribution functions.

This document must be read in conjunction with the AAF Specification V1.1, since it does not repeat any of the contents of the AAF Specification –this document states constraints on the AAF Specification and defines necessary AAF Extensions which collectively form the ASPA Profile for AAF.

ASPA files may be stored in accordance with the MXF format specification, SMPTE 377M. All data and constraints specified herein apply equally to ASPA-MXF files as to ASPA-AAF files.

4 Terminology

4.1 Notation

In this document, all terms which refer specifically to defined items within the AAF Specification and Software Development Kit (SDK) are in `Courier` font. Some examples may be seen in paragraph 4.3 below.

4.2 File Kinds

In this document, some shorthand phrases are used to avoid repetitive language:

"File" – means any AAF/MXF File, whether conforming to the ASPA Profile or not.

"ASPA File" – means an AAF/MXF File which conforms to the ASPA Profile.

"non-ASPA File" – means an AAF/MXF File which does not conform to the ASPA Profile.

"Other File" – means any file which is not an AAF/MXF File.

4.3 Manner of Specification

This document must be read in conjunction with the AAF Specification. The major sections and subsections of this document are matched with those of the AAF Specification.

This document does not repeat any of the contents of the AAF Specification. Instead, it defines three kinds of variations on the AAF specification: numerical constraints, semantic constraints and extensions.

4.3.1 Numerical Constraints

Numerical Constraints on the AAF specification limit the capacity of a File. They may be constraints on the number of a given `Object` allowed in an ASPA File, or specific ranges for given `Property` values in an ASPA File. Numerical Constraints are given in the form of tables.

4.3.2 Semantic Constraints

Each set of numerical constraints is followed by a set of semantic constraints, which serve two purposes: they give a prose explanation of the given numerical constraints, and they define additional restrictions upon combinations of `Objects` and `Property` values which are not possible to clearly tabulate.

Numerical and Semantic constraints are presented in the same order as the AAF Specification to which they relate and with corresponding major section and sub-section numbering.

4.3.3 Extensions

Extensions are specifications for Classes, Objects, Properties, Types and Definitions peculiar to ASPA Files that are not built in to the standard AAF Specification or SDK. All Extensions are created using the standard AAF extension model (thus, all SCOTS AAF implementations will have the capacity to process ASPA Files).

Extensions are presented after the Constraints in each major section of this document.

5 Class Packages

The ASPA Profile does not alter the provisions of this chapter of the AAF Specification in any way.

6 Structural Metadata Classes

6.1 Header

The ASPA Profile alters this AAF Class Specification as follows:

6.1.1 Numerical Constraints

The ASPA Profile does not change any numerical constraints on this class. Thus:

ASPA Files shall contain one and only one Header object.

6.1.2 Semantic Constraints

ASPA Files shall contain only the `Preface` subclass of `Header`, as defined by MXF.

6.1.3 Extensions

Preface defines three required properties: `OperationalPattern`, `EssenceContainers` and `DMSchemes`.

6.2 Identification

The ASPA Profile does not alter this AAF Class Specification in any way.

6.3 Dictionary

The ASPA Profile does not alter this AAF Class Specification in any way.

6.4 ContentStorage

The ASPA Profile does not alter this AAF Class Specification in any way.

6.5 Mob

The ASPA Profile alters this AAF Class Specification as follows:
ASPA Files shall contain only the following subclasses of `Mob`

- `MasterMob`
- `SourceMob`

Each Mob in an ASPA File shall contain the following numbers of Slots:

0 or 1 TimelineSlot, with a DataDefinition equal to Picture.

0 or 1 StaticSlot, with a DataDefinition equal to Picture.

1 or more StaticSlot, with a DataDefinition equal to DescriptiveMetadata.

– plus any other Slots specified for subclasses of Mob (see below).

6.6 CompositionMob

The ASPA Profile does not alter this AAF Class Specification in any way.

However, note that `CompositionMob` objects are not present in ASPA Files

6.7 MasterMob

The ASPA Profile alters this AAF Class Specification as follows.

6.7.1 Numerical Constraints

ASPA Files shall contain one and only one MasterMob.

6.7.2 Semantic Constraints

The MasterMob shall contain at least a StaticSlot with DataDefinition equal to DescriptiveMetadata; containing Level 0 Metadata.

Level 0 Metadata is carried in a DMSegment containing an ASPA_Framework (see 17.1 below), which in turn contains a DM_Set_File (see 17.3 below). .

6.8 SourceMob

The ASPA Profile alters this AAF Class Specification as follows.

6.8.1 Numerical Constraints

ASPA Files shall contain one top-level SourceMob for each EssenceData object in the file (a top-level SourceMob is one that is directly referenced by a MasterMob).

ASPA Files may also contain a lower-level SourceMob for each EssenceData object in the file (a lower-level SourceMob is one that is referenced by another SourceMob).

ASPA Files may contain additional top-level SourceMobs for which there is no EssenceData object in the file. These SourceMobs describe external essence. ASPA Files shall contain one lower-level SourceMob for each external essence SourceMob object in the file.

6.8.2 Semantic Constraints

Each top-level SourceMob shall contain at least a StaticSlot with DataDefinition equal to DescriptiveMetadata; containing Level 1 Metadata.

Level 1 Metadata is carried in a DMSegment containing an ASPA_Framework (see 17.1 below), which in turn contains a subclass of DM_Set (see 17.2 below). The subclass of DM_Set shall be of the class appropriate to the Essence type.

Additionally, the top-level SourceMob may contain zero or more Slots with DataDefinition equal to DescriptiveMetadata; containing Level 2 Metadata.

Additionally, the top-level SourceMob may contain one TimelineSlots with DataDefinition equal to Timecode; containing UTCComponents as defined in section .

Additionally, the top-level SourceMob may contain zero or more Event Slots with DataDefinition equal to SynchronousDynamicMetadata; containing DynamicMarkers or subclasses as defined in section 18.

Each top-level SourceMob shall contain a subclass of FileDescriptor appropriate to the Essence type. The top-level SourceMob shall contain at least one Slot with a DataDefinition appropriate to the Essence type. The Segments of such Slots may contain a zero-value SourceReference, or a SourceReference to a lower-level SourceMob.

Each lower-level SourceMob shall contain an ImportDescriptor with a Locator naming the file that was imported to create the top-level SourceMob and EssenceData object.The lower-level SourceMob

shall contain at least one `Slot` with a `DataDefinition` appropriate to the Essence type. The `Segments` of such `Slots` shall contain a zero-value `SourceReference`.

6.9 Slot

The ASPA Profile does not alter this AAF Class Specification in any way.

6.10 TimelineSlot

The ASPA Profile does not alter this AAF Class Specification in any way.

6.11 EventSlot

The ASPA Profile does not alter this AAF Class Specification in any way.

6.12 StaticSlot

The ASPA Profile does not alter this AAF Class Specification in any way.

6.13 KLVData

The ASPA Profile does not alter this AAF Class Specification in any way.

Note: the SMPTE KLV Sets contained within `KLVData` objects may include any of the MISB-defined KLV Sets including Security Metadata Sets (MISB RP-0102), Predator Standard Metadata Sets (MISB EG-0104) and so on.

6.14 TaggedValue

The ASPA Profile does not alter this AAF Class Specification in any way.

6.15 Parameter

The ASPA Profile does not alter this AAF Class Specification in any way.

6.16 ConstantValue

The ASPA Profile does not alter this AAF Class Specification in any way.

6.17 VaryingValue

The ASPA Profile does not alter this AAF Class Specification in any way.

6.18 ControlPoint

The ASPA Profile does not alter this AAF Class Specification in any way.

6.19 Locator

The ASPA Profile does not alter this AAF Class Specification in any way.

6.20 NetworkLocator

The ASPA Profile does not alter this AAF Class Specification in any way.

6.21 TextLocator

The ASPA Profile does not alter this AAF Class Specification in any way.

7 Component Classes

7.1 Component

The ASPA Profile does not alter this AAF Class Specification in any way.

7.2 Transition

The ASPA Profile does not alter this AAF Class Specification in any way.

7.3 Segment

The ASPA Profile does not alter this AAF Class Specification in any way.

7.4 Sequence

The ASPA Profile alters this AAF Class Specification as follows:
ASPA Files shall not contain any `Sequence` objects

7.5 Filler

The ASPA Profile alters this AAF Class Specification as follows:

7.5.1 Numerical Constraints

ASPA Files shall not contain any `Filler` objects.

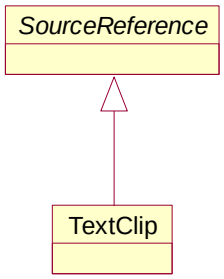
7.6 SourceReference

7.6.1 Extensions

The ASPA Profile defines the `TextClip` subclass of `SourceReference`, as follows:

`TextClip` has a weak reference to a Slot describing text essence data.

`TextClip` is an abstract class and is a subclass of `SourceReference`.



The `TextClip` class does not define any properties.

`TextClip` references a Mob Slot containing text essence data.

7.7 SourceClip

The ASPA Profile does not alter this AAF Class Specification in any way.

7.8 Event

The ASPA Profile does not alter this AAF Class Specification in any way.

7.9 CommentMarker

The ASPA Profile does not alter this AAF Class Specification in any way.

7.10 DescriptiveMarker

The ASPA Profile alters this AAF Class Specification as follows:.

7.10.1 Extensions

The ASPA Profile defines the `DynamicMarker` subclass of `DescriptiveMarker`, and the `DynamicClip` subclass of `DynamicMarker`, as described in section 18 below.

7.11 GPITrigger

The ASPA Profile alters this AAF Class Specification as follows:

7.11.1 Numerical Constraints

ASPA Files shall not contain any `GPITrigger` objects.

7.12 Timecode

The ASPA Profile does not alter this AAF Class Specification in any way.

7.13 TimecodeStream

The ASPA Profile does not alter this AAF Class Specification in any way.

7.14 TimecodeStream12M

The ASPA Profile does not alter this AAF Class Specification in any way.

7.15 Edgecode

The ASPA Profile alters this AAF Class Specification as follows:

7.15.1 Numerical Constraints

ASPA Files shall not contain any `Edgecode` objects.

7.16 Pulldown

The ASPA Profile alters this AAF Class Specification as follows:

7.16.1 Numerical Constraints

ASPA Files shall not contain any `Pulldown` objects.

7.17 OperationGroup

The ASPA Profile alters this AAF Class Specification as follows:

7.17.1 Numerical Constraints

ASPA Files shall not contain any `OperationGroup` objects.

7.18 NestedScope

The ASPA Profile alters this AAF Class Specification as follows:

7.18.1 Numerical Constraints

ASPA Files shall not contain any `NestedScope` objects.

7.19 ScopeReference

The ASPA Profile alters this AAF Class Specification as follows:

7.19.1 Numerical Constraints

ASPA Files shall not contain any `ScopeReference` objects.

7.20 Selector

The ASPA Profile alters this AAF Class Specification as follows:

7.20.1 Numerical Constraints

ASPA Files shall not contain any `Selector` objects.

7.21 EssenceGroup

The ASPA Profile alters this AAF Class Specification as follows:

7.21.1 Numerical Constraints

ASPA Files shall not contain any `EssenceGroup` objects.

8 Definition Classes

The ASPA Profile does not alter the provisions of this chapter of the AAF Specification in any way.

9 Essence Data Classes

The ASPA Profile does not alter the provisions of this chapter of the AAF Specification in any way.

9.1 EssenceData

The ASPA Profile does not alter this AAF Class Specification in any way.

10 Standard Essence Descriptor Classes

10.1 EssenceDescriptor

The ASPA Profile does not alter this AAF Class Specification in any way.

10.2 FileDescriptor

The ASPA Profile does not alter this AAF Class Specification in any way.

10.3 DigitalImageDescriptor

The ASPA Profile does not alter this AAF Class Specification in any way.

10.4 CDCIDescriptor

The ASPA Profile does not alter this AAF Class Specification in any way.

10.5 RGBADescriptor

The ASPA Profile does not alter this AAF Class Specification in any way.

10.6 TapeDescriptor

The ASPA Profile alters this AAF Class Specification as follows:

10.6.1 Numerical Constraints

ASPA Files shall not contain any `TapeDescriptor` objects.

10.7 FilmDescriptor

The ASPA Profile alters this AAF Class Specification as follows:

10.7.1 Numerical Constraints

ASPA Files shall not contain any `FilmDescriptor` objects.

11 Essence Descriptor Classes for Non-Normative Essence Types

11.1 WAVEDescriptor

The ASPA Profile alters this AAF Class Specification as follows:

11.1.1 Numerical Constraints

ASPA Files shall not contain any `WaveDescriptor` objects.

11.2 AIFCDescriptor

The ASPA Profile alters this AAF Class Specification as follows:

11.2.1 Numerical Constraints

ASPA Files shall not contain any `AIFCDescriptor` objects.

11.3 TIFFDescriptor

The ASPA Profile does not alter this AAF Class Specification in any way.

12 Essence Descriptor Classes for Common Compressed Picture Types

12.1 MPEG2VDescriptor

The ASPA Profile does not alter this AAF Class Specification in any way.

12.2 DVDescriptor

The ASPA Profile does not alter this AAF Class Specification in any way.

12.3 JFIFDescriptor

The ASPA Profile does not alter this AAF Class Specification in any way.

13 Essence Descriptor Classes for Sound Essence Types

13.1 SoundDescriptor

The ASPA Profile does not alter this AAF Class Specification in any way.

13.2 PCMDescriptor

The ASPA Profile does not alter this AAF Class Specification in any way.

13.3 PCM8Descriptor

This section of the AAF Specification is presently not complete.

ASPA Files shall not contain any `PCM8Descriptor` objects.

13.4 AES3PCMDescriptor

The ASPA Profile does not alter this AAF Class Specification in any way.

13.5 NonPCMDescriptor

This section of the AAF Specification is presently not complete.

The ASPA Profile does not alter this AAF Class Specification in any way.

14 Essence Descriptor Classes for Multiple and Generic Container Essence Types

14.1 MultipleDescriptor

The ASPA Profile alters this AAF Class Specification as follows:

14.1.1 Numerical Constraints

`MultipleDescriptors` in ASPA Files may contain `RP217Descriptor` objects or `MPEG2MetadataDescriptor` objects.

ASPA Files shall not set the `EssenceContainer` property to `GC_PS` or `GC_PES` or `GC_ES` (defined in the SMPTE Labels Registry).

14.1.2 Semantic Constraints

ASPA Files may contain only MPEG-2 Transport Streams, with or without RP217 KLV Private Data Streams.

14.2 MPEG2SysDescriptor

The ASPA Profile alters this AAF Class Specification as follows:

14.2.1 Numerical Constraints

ASPA Files may contain instances of this class.

14.2.2 Semantic Constraints

ASPA Files may contain only MPEG-2 Transport Streams, with or without RP217 KLV Private Data Streams.

14.3 SysDescriptor

ASPA Files shall not contain any `SysDescriptor` objects.

14.4 AuxDescriptor

ASPA Files shall not contain any `AuxDescriptor` objects.

15 Descriptors for Physical Essence

AAF V1.1 defines the following additional Descriptors:

15.1 PhysicalDescriptor

The `PhysicalDescriptor` class is an abstract superclass which is the parent class for all descriptors of Essence which are indirectly manipulated by AAF applications. It is a peer of the FileDescriptor class (which is the parent class for all descriptors of Essence which are directly manipulated by AAF applications).

The `PhysicalDescriptor` class is a subclass of the `EssenceDescriptor` class. It is defined by the AAF Specification V1.1. The ASPA Profile does not alter this AAF Class Specification in any way.

`PhysicalDescriptor` does not add any new properties to `EssenceDescriptor`.

15.2 ImportDescriptor

An `ImportDescriptor` specifies the external file that was imported to create a `SourceMob` and `EssenceData` object.

An ImportDescriptor is a concrete subclass of AbstractPhysicalDescriptor. It is defined by the AAF Specification V1.1. The ASPA Profile does not alter this AAF Class Specification in any way.

`ImportDescriptor` does not define any new properties.

15.3 RecordingDescriptor

ASPA Files shall not contain any `RecordingDescriptor` objects.

15.4 AuxiliaryFileDescriptor

`AuxiliaryFileDescriptor` specifies an auxiliary file to be included in an ASPA file.It is defined by the AAF Specification V1.1. The ASPA Profile does not alter this AAF Class Specification in any way.

`AuxiliaryFileDescriptor` is a concrete subclass of `AbstractPhysicalDescriptor`.

`AuxiliaryFileDescriptor` adds the following properties:

Property Name	Type	Explanation
`MimeType`	`String`	the registered MIME media type used by the data as defined in RFC 2046 and registered according to RFC 2048. Example: `L"text/html"` Required.
`CharSet`	`String`	the registered character set used by the internal and external representation of the data as defined in RFC 2048 and http://www.iana.org/assignments/character-sets Example: `L"ISO-8859-1"` Optional.

16 Additional Descriptors for ASPA Profile

The ASPA Profile defines the following additional Descriptors:

16.1 RP217Descriptor

The RP217Descriptor class specifies how KLV packets are contained within an MPEG-2 Systems Stream in a FileSourceMob in an ASPA File.

The RP217Descriptor class is a subclass of the DataEssenceDescriptor class.

RP217Descriptor adds the following properties:

Property Name	Type	Explanation
RP217DataStreamPID	Uint16	The ISO 13818-1 Transport Stream PID for the KLVPDS stream Required.
RP217VideoStreamPID	Uint16	The ISO 13818-1 Transport Stream PID for the Video stream Required.

16.1.1 Numerical Constraints

ASPA Files may contain instances of this class.

16.1.2 Semantic Constraints

The ContainerFormat property of the FileDescriptor shall be set to the constant value for KLVA as defined in the SMPTE Labels Registry: 0x060e2b34 04010102 0D010301 02090602. This corresponds to MPEG-2 TS, PES private data, clip wrapping.

16.2 MPEG2MetadataDescriptor

The MPEG2MetadataDescriptor class specifies how metadata packets are contained within an MPEG-2 Systems Stream in a FileSourceMob in an ASPA File.

The MPEG2MetadataDescriptor class is a subclass of the FileDescriptor class.

The MPEG2MetadataDescriptor does not add any new properties to the FileDescriptor.

16.2.1 Numerical Constraints

ASPA Files may contain instances of this class.

16.2.2 Semantic Constraints

The ContainerFormat property of the FileDescriptor shall be set to the registered value for KLV formatted per ISO 13818-1:2000- Amd 1 as defined in the SMPTE RP224 Labels Registry:.

16.3 NITFDescriptor

The NITFDescriptor class specifies how NITF images are contained within a FileSourceMob in an ASPA File.

The NITFDescriptor class is a subclass of the FileDescriptor class.

The NITFDescriptor does not add any new properties to the FileDescriptor.

16.3.1 Numerical Constraints

ASPA Files may contain instances of this class.

16.3.2 Semantic Constraints

The ContainerFormat property of the FileDescriptor shall be set to the constant value for NITF, which shall be registered in the SMPTE RP224 Labels Registry.

16.4 ParsedTextDescriptor

ParsedTextDescriptor specifies a text file to be included in an ASPA file.

ParsedTextDescriptor is an abstract subclass of FileDescriptor.

ParsedTextDescriptor adds the following properties:

Property Name	Type	Explanation
Encoding	String	the registered character set used by the external representation of the data as defined in RFC 2048 and http://www.iana.org/assignments/character-sets Example: L"UTF-8" Required.

16.5 SGMLDescriptor

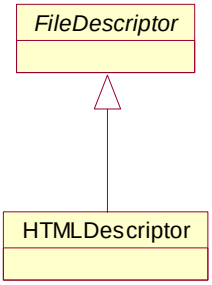
SGMLDescriptor is an abstract subclass of ParsedTextDescriptor.

The SGMLDescriptor does not add any new properties to the ParsedTextDescriptor.

16.6 HTMLDescriptor

HTMLDescriptor specifies that the essence data is in HTML text format.

HTMLDescriptor is a concrete subclass of SGMLDescriptor. An HTMLDescriptor object is owned by a File SourceMob object.



An HTMLDescriptor object specifies that the File SourceMob describes an HTML object, which contains text, formatted according to the HTML standard.

HTMLDescriptor adds the following properties:

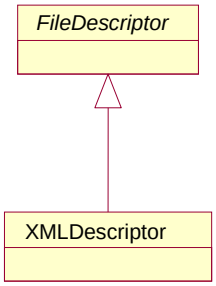
Property Name	Type	Explanation
DocType	String	the complete <!DOCTYPE > declaration for this HTML document as defined in the relevant www.w3c.org/TR documents Required.

Example: `L"<!DOCTYPE HTML PUBLIC \"-//W3C//DTD HTML 4.01 Transitional//EN\">"`

16.7 XMLDescriptor

`XMLDescriptor` specifies that the essence data is in XML text format.

`XMLDescriptor` is a concrete subclass of `TextFileDescriptor`. An `XMLDescriptor` object is owned by a File `SourceMob` object.



`XMLDescriptor` adds the following properties:

Property Name	Type	Explanation
`DefaultNamespaceURI`	`String`	the URI of the default namespace for this XML document as defined in the relevant www.w3c.org/TR documents Example: L"http://www.smpte.org/test" Required
`NamespaceTags`	`StringArray`	the Namespace Tags used in QNames in this XML document Example: L"aaf", L"xsi" Optional
`NamespaceURIs`	`StringArray`	the URIs associated with Namespace Tags used in QNames in this XML document Example: L"http://www.aafassociation.org/test",L”http://www.w3.org/2001/XMLSchema-instance” Optional

An `XMLDescriptor` object specifies that the File `SourceMob` describes an XML object, which contains text, formatted according to the XML standard.

16.8 LIDARDescriptor

The LIDARDescriptor class specifies how Lidar files are contained within a FileSourceMob in an ASPA File.

The LIDARDescriptor class is a subclass of the DataEssenceDescriptor class.

The LIDARDescriptor does not add any new properties beyond those of the DataEssenceDescriptor class.

16.8.1 Numerical Constraints

ASPA Files may contain instances of this class.

16.8.2 Semantic Constraints

The ContainerFormat property of the FileDescriptor shall be set to the constant value GC_LAS_V1, which shall be registered in the MISB Metadata Registry.

16.9 LVSDDescriptor

The LVSDDescriptor class specifies how Large Volume Streaming Data (LVSD) essence is contained within a FileSourceMob in an ASPA File.

The LVSDDescriptor class is a subclass of the RGBADescriptor class.

The LIDARDescriptor does not add any new properties beyond those of the DataEssenceDescriptor class.

16.9.1 Numerical Constraints

ASPA Files may contain instances of this class.

16.9.2 Semantic Constraints

LVSD essence shall be composed of sequences of JPEG2000 codestreams (one for each imagery source) in accordance with SMPTE 422M-2006. LVSDDescriptor instances shall include JP2KSubDescriptors that indicate the specific JP2K profile used to compress the images.

ASPA Files describe LVSD essence by default as sequences of images from a single image source (e.g. camera). To accommodate imagery that is interleave differently (for example, streams that contain several co-timed images from different source), these sequences may be as short as a single image.

The current version of the ASPA spec does not address description or carriage of mosaics of images

The ContainerFormat property of the FileDescriptor shall be set to the constant value GC_LVSD_V1, which shall be registered in the MISB Metadata Registry.

17 Dynamic Metadata

(This chapter of the AAF Specification is presently intentionally unused, reserved for specifications of additional AAF Classes).

SMPTE377M MXF Format and SMPTE EG42 MXF Descriptive Metadata define abstract classes for Descriptive Metadata. The ASPA Profile defines concrete subclasses for Dynamic Metadata, as detailed in the following subsections.

ASPA Files may include as optional properties of Descriptive Metadata classes any other attributes from the D&R IDM which apply to all Product Formats, provided that the D&R IDM defines a SMPTE Universal Label for that attribute. Methodology for adding these properties is described in above. The SMPTE Universal Label shall be used as the unique identifier of this attribute in a

`PropertyDefinition` for the `ClassDefinition` of the appropriate class in the `MetaDictionary` of this ASPA File.

Methodology for properly adding properties is as follows:

Every new ASPA to D&R IDD mapping that is added will generate a new row in the D&R IDM (many rows if a single ASPA property maps to multiple D&R IDM attributes)

When a new property is required to be added to ASPA, the following steps must be carried out:

1. Ensure the property is present in the D&R IDD

   (Ensure it is also present in ISO 19115)

2. Identify the appropriate AAF Class

   If the Property applies to a single Product_Format, use the ASPA_DM_Set for that Product_Format

   If the Property applies to multiple concrete classes, use the ASPA_DM_Set superclass (the AAF superclass which they all have in common

3. Choose a symbolic name for the Property (it need not be unique beyond the direct ancestor and descendant classes, but it must not contain punctuation other than _)

4. Identify the data type (from AAF Types, as recorded in SMPTE Registry)

5.Obtain a SMPTE UL from the appropriate registry (This is the normative reference.)

   Determine which Registry applies (RP210, DoD Public, DoD Private)

   RP210: submit entry to SMPTE W25

   DoD Public: submit to TBD

   DoD Private: submit to TBD

6. Add an entry to the D&R IDM containing:

   AAF Class Name

   AAF Property Name

   AAF Type

   SMPTE UL

   D&R IDD Entity

   D&R IDD Attribute

7. Create an AAF Property Definition in the application code

   Each Property registration requires a single API call on the appropriate class Definition

   (in future, write and publish the AAF-X schema fragment)

Similar procedures are used to define new Classes

Similar procedures are used to define new Types (including enumerated values)

17.1 ASPA_Framework

The `ASPA_Framework` class is a container for dynamic metadata defined by ASPA. The classid of the `ASPA_Framework` class identifies the dynamic metadata as conforming to ASPA.

The ASPA_Framework class is a concrete subclass of the DMFramework class defined by SMPTE EG42 (aka the DescriptiveFramework class defined by AAF V1.1).

DMFramework adds the required SetReference property:

Property Name	Type	Explanation
SetReference	Strong Reference to DM_Set	The dynamic metadata of the appropriate class. Required.

17.2 ASPA_DM_Set

The ASPA_DM_Set class is a container for dynamic metadata defined by ASPA.

The ASPA_DM_Set class is a abstract subclass of the DM_Set class defined by SMPTE EG42 (aka the DescriptiveObject class of AAF V1.2)

DM_Set predefines the following properties:

Property Name	Type	Explanation
Security_Classification	String Required	The string that represents the Security Classification
Country_Code_Method	String Optional	The coding method used to identify the Non-US classifying country and countries in the releasing instructions. Method is restricted to ISO-3166 two letter, ISO-3166 three letter, FIPS10-4 two letter
Object_Country_Code	String Optional	This maximum 40 character string contains two or three character code(s) as defined by the Country_Code_Method, identifying the country (or countries) that is the object of the video or metadata in the transport stream or file. Multiple codes shall be separated by a semi-colon ";" (no spaces). Multiple codes shall be concatenated in one object country code metadata element entry and shall not be encoded as individual metadata elements.
Non_US_Classification_Country	String Optional	This metadata element contains a value for the Non-US classifying country code.
Caveats	String Optional	All pertinent caveats/codewords from each category of the CAPCO register
Release_Instructions	String Optional	Valid list of country codes to which countries the file is authorized for release. When multiple countries are listed, countries are separated by a space.
Classification_Comment	String Optional	Comments pertaining to security
Product_Format	String Required	The code that represents an NSGI standard format for a DATASET (per the NERS Appendix D Table 2), or a format that is available from a Library as an alteration (also known as an export format). The native format in which the NSGI Library stores the data
Product_Title	String Optional	The name by which the DATASET is known.
Creation_Time	Timestamp Optional	Identifies the date or the date and time that the product was created or last modified.

Property Name	Type	Explanation
Originators_Name	String Optional	The text that represents the originator.
Originating_Station_ID	String Optional	The identifier that represents the originating organization, system, station or product.

All these properties are defined by the D&R IDM (Rev E). Additional properties may be defined by later revisions of the D&R IDM.

Instances of DM_Set shall include all properties marked as Required, and may include any of the properties marked as Optional.

In addition, instances of DM_Set may include as optional properties any other attributes from the D&R IDM which apply to all Product Formats, provided that the D&R IDM defines a SMPTE Universal Label for that attribute. Methodology for adding these properties is described in above. The SMPTE Universal Label shall be used as the unique identifier of this attribute in a PropertyDefinition for the ClassDefinition of DM_Set in the MetaDictionary of this ASPA File.

17.3 DM_Set_File

The DM_Set_File class is a container for ASPA level 0 metadata, which is metadata that pertains to the total file. The DM_Set_File class is a concrete subclass of ASPA_DM_Set.

DM_Set_File inherits all properties of ASPA_DM_Set, and predefines no additional properties. Additional properties may be defined by later revisions of the D&R IDM.
Instances of DM_Set_File shall include all properties marked as Required, and may include any of the properties marked as Optional.

The required property Product_Format of the superclass DM_Set shall have the value "AAF_ASPA".

In addition, instances of DM_Set_File may include as optional properties any other attributes from the D&R IDM which apply to the overall ASPA file, provided that the D&R IDM defines a SMPTE Universal Label for that attribute. Methodology for adding these properties is described in above. The SMPTE Universal Label shall be used as the unique identifier of this attribute in a PropertyDefinition for the ClassDefinition of this class in the MetaDictionary of this ASPA File.

Additionally, the MobID of the MasterMob to which this set is attached is mapped to the D&R IDM DATASET: DATASET Identification Text attribute.

17.4 DM_Set_MPEGKLV_Layer

The DM_Set_MPEGKLV_Layer class is a container for ASPA level 1 metadata, which is metadata that pertains to a product of type MPEGKLV within the file. The DM_Set_MPEGKLV_Layer class is a concrete subclass of ASPA_DM_Set.

DM_Set_MPEGKLV_Layer adds the following properties:

Property Name	Type	Explanation
Image_Source_Device	String Optional	A free text identification of the particular image sensor type and serial number.

Property Name	Type	Explanation
Start_Date_Time	Timestamp Optional	The date and time an image was collected.
Bounding_Rectangle	GeographicArea Optional	Defines the boundary for an area of inclusion or exclusion for an IMAGE.
Platform_Designation	String Optional	Platform ID. From KLV Platform Designation.
Target_ID	String Optional	Combination of BE Number, OSUFFIX, and Country Code. From KLV Target Id.
Duration	Uint64 Optional	Duration of the MPEG essence, in milliseconds.
Motion_Imagery_ID	String Optional	Multi-field identifier derived from the MI stream using the algorithm defined in RP 0608.1 The ID is used to identify each unique clip.

Instances of DM_Set_MPEGKLV_Layer shall include all properties marked as Required, and may include any of the properties marked as Optional.

The required property Product_Format shall have the value "MPEGKLV".

All these properties are defined by the D&R IDM (Rev E). Additional properties may be defined by later revisions of the D&R IDM.

In addition, instances of DM_Set_MPEGKLV_Layer may include as optional properties any other attributes from the D&R IDM which apply to this Product Format, provided that the D&R IDM defines a SMPTE Universal Label for that attribute. Methodology for adding these properties is described in above. The SMPTE Universal Label shall be used as the unique identifier of this attribute in a PropertyDefinition for the ClassDefinition of this class in the MetaDictionary of this ASPA File.

Additionally, the MobID of the SourceMob to which this set is attached is mapped to the D&R IDM DATASET: DATASET Identification Text attribute.

17.5 DM_Set_NITF_Layer

The DM_Set_NITF_Layer class is a container for ASPA level 1 metadata, which is metadata that pertains to a product of type NITF within the file. The DM_Set_NITF_Layer class is an abstract subclass of ASPA_DM_Set.

ASPA Files may contain one of the concrete subclasses of DM_SET_NITF_Layer:

```
DM_Set_NITF21_Layer
DM_Set_NITF20_Layer
DM_Set_NSIF10_Layer
```

DM_Set_NITF_Layer adds the following properties:

Property Name	Type	Explanation
Date_and_Time	AAFTimeStamp Optional	This field shall contain the time of the image acquisition. From NITF IDATIM.

Property Name	Type	Explanation
Target_ID	String Optional	For NITF 2.0: Combination of BE Number, Functional Category Code and Country Code. For NITF 2.1 and NSIF 1.0: Combination of BE Number, OSUFFIX, and Country Code from NITF TGTID.
Geographic_Location	Geographic Polygon Optional	Defines the boundary for an area of inclusion or exclusion for an IMAGE. This shall be calculated as the bounding rectangle that includes all IMAGE layers within the NITF file.

All these properties are mapped into the D&R IDM (Rev E).

Instances of DM_Set_NITF_Layer shall include all properties marked as Required, and may include any of the properties marked as Optional.

The required property Product_Format shall have the value "NITF", optionally suffixed by the NITF version number, for example: "NITF02.10".

All these properties are defined by the D&R IDM (Rev E). Additional properties may be defined by later revisions of the D&R IDM.

In addition, instances of DM_Set_NITF_Layer may include as optional properties any other attributes from the D&R IDM which apply to this Product Format, provided that the D&R IDM defines a SMPTE Universal Label for that attribute. Methodology for adding these properties is described in above. The SMPTE Universal Label shall be used as the unique identifier of this attribute in a PropertyDefinition for the ClassDefinition of this class in the MetaDictionary of this ASPA File.

Additionally, the MobID of the SourceMob to which this set is attached is mapped to the D&R IDM DATASET: DATASET Identification Text attribute.

17.6 DM_Set_JFIF_Layer

The DM_Set_JFIF_Layer class is a container for ASPA level 1 metadata, which is metadata that pertains to a product of type JFIF within the file. The DM_Set_JFIF_Layer class is a concrete subclass of ASPA_DM_Set.

DM_Set_JFIF_Layer adds the following properties:

Property Name	Type	Explanation
Description	String Optional	The text that describes source material for an IMAGE.

All these properties are mapped into the D&R IDM (Rev E)

Instances of DM_Set_JFIF_Layer shall include all properties marked as Required, and may include any of the properties marked as Optional.

The required property Product_Format shall have the value "JFIF".

All these properties are defined by the D&R IDM (Rev E). Additional properties may be defined by later revisions of the D&R IDM.

In addition, instances of DM_Set_JFIF_Layer may include as optional properties any other attributes from the D&R IDM which apply to this Product Format, provided that the D&R IDM defines a SMPTE Universal Label for that attribute. Methodology for adding these properties is described in above. The SMPTE Universal Label shall be used as the unique identifier of this attribute in a PropertyDefinition for the ClassDefinition of this class in the MetaDictionary of this ASPA File.

Additionally, the MobID of the SourceMob to which this set is attached is mapped to the D&R IDM DATASET: DATASET Identification Text attribute.

17.7 DM_Set_HTML_Layer

The DM_Set_HTML_Layer class is a container for ASPA level 1 metadata, which is metadata that pertains to a product of type HTML within the file. The DM_Set_HTML_Layer class is a concrete subclass of ASPA_DM_Set.

DM_Set_HTML_Layer adds the following properties:

Property Name	Type	Explanation
Description	String Optional	The text that describes source material for an HTML document.
Lang	String Optional	Code indicating the language used on an item.

All these properties are mapped into the D&R IDM (Rev E)

Instances of DM_Set_HTML_Layer shall include all properties marked as Required, and may include any of the properties marked as Optional.

The required property Product_Format shall have the value "HTML".

All these properties are defined by the D&R IDM (Rev E). Additional properties may be defined by later revisions of the D&R IDM.

In addition, instances of DM_Set_HTML_Layer may include as optional properties any other attributes from the D&R IDM which apply to this Product Format, provided that the D&R IDM defines a SMPTE Universal Label for that attribute. Methodology for adding these properties is described in above. The SMPTE Universal Label shall be used as the unique identifier of this attribute in a PropertyDefinition for the ClassDefinition of this class in the MetaDictionary of this ASPA File.

Additionally, the MobID of the SourceMob to which this set is attached is mapped to the D&R IDM DATASET: DATASET Identification Text attribute.

17.8 DM_Set_LIDAR_Layer

The DM_Set_LIDAR_Layer class is a container for ASPA level 1 metadata, which is metadata that pertains to a product of type LIDAR within the file. The DM_Set_LIDAR_Layer is a subclass of ASPA_DM_Set.

The ASPRS LIDAR standard (LAS) file format, as the industry standard open file format, is currently the only supported encapsulation of LIDAR data.

DM_Set_LIDAR_Layer contains the following properties:

Property Name	Type	Explanation
Project_ID_Data	UID Optional	Global Unique Identifier intended to provide space for uniquely identifying a LIDAR project. Derived from LASF 1.1 PUBLIC HEADER fields GUID data 1 through 4.
File_Source_ID	Uint32 Optional	A LIDAR project can indicate a number of unique sources, such as files containing an original flight line or the result of a merge or extract operation. This field uniquely identifies these sources. Derived from LASF 1.1 PUBLIC HEADER field File Source ID.
LIDAR_ Bounding_Rectangle	GeographicArea Optional	Defines the boundary geographic extents of coverage for the LIDAR essence being described. Computed from Georeferencing variable length records, if present, in LASF 1.1.
System_Identifier	String Optional	Specifies the system which gathered the LIDAR data. Derived from LASF 1.1 PUBLIC HEADER field System Identifier.

Instances of DM_Set_LIDAR_Layer shall include all properties marked "Required", and may include any of the properties marked as "Optional".

The required property Product_Format shall have the value "LASF", suffixed by the LASF version number. Possible values are "LASF1.0" and "LASF1.1".

In addition, instances of DM_Set_LIDAR_Layer may include as optional properties any other attributes from the D&R IDM which apply to this Product Format, provided that the D&R IDM defines a SMPTE Universal Label for that attribute. Methodology for adding these properties is described in above. The SMPTE Universal Label shall be used as the unique identifier of this attribute in a PropertyDefinition for the ClassDefinition of this class in the MetaDictionary of this ASPA File.

17.9 DM_Set_LVSD_Layer

The DM_Set_LVSD_Layer class is a container for ASPA level 1 metadata, which is metadata that pertains to a product of type LVSD within the file. The DM_Set_LVSD_Layer is a subclass of ASPA_DM_Set.

DM_Set_LVSD_Layer contains the following properties:

Property Name	Type	Explanation

LVSD_ Bounding_Rectangle	GeographicArea Optional	Defines the boundary geographic extents of coverage for the LVSD essence being described. Computed from the GeographicQuadrilateralStream data in the SynchronizedDynamicMetadata slot of the FilePackage.

Instances of DM_Set_LVSD_Layer shall include all properties marked "Required", and may include any of the properties marked as "Optional".

The required property Product_Format (inherited from ASPA_DM_Set) shall have the value "LVSD"

In addition, instances of DM_Set_LVSD_Layer may include as optional properties any other attributes from the D&R IDM which apply to this Product Format, provided that the D&R IDM defines a SMPTE Universal Label for that attribute. Methodology for adding these properties is described in above. The SMPTE Universal Label shall be used as the unique identifier of this attribute in a PropertyDefinition for the ClassDefinition of this class in the MetaDictionary of this ASPA File.

18 DynamicMarker Classes

(This chapter of the AAF Specification is presently intentionally unused, reserved for specifications of additional AAF Classes).

18.1 DynamicMarker Class

The DynamicMarker class is a container for synchronous dynamic metadata defined by ASPA.

The DynamicMarker class is a concrete subclass of the DescriptiveMarker class of AAF V1.2(aka the DMSegment class defined by SMPTE EG42).

The reference time for the synchronous dynamic metadata is carried in the Position property of the Event superclass. The synchronous dynamic metadata itself is carried in the KLVData property of the Component superclass.

The DynamicMarker class adds the following properties to DescriptiveMarker:

Property Name	Type	Explanation
ToleranceMode	ToleranceModeType	An integer that enumerates the mode of determining the reference time of this DynamicMarker. Allowed values are as follows: Estimated Assumed Precise Window Interpolated The meaning of these modes is described in section 21.4 below Required.

Property Name	Type	Explanation
InterpolationMethod	WeakReference InterpolationDefinition	A reference to the well-known interpolation method used to interpolate metadata values to the reference time. Optional
ToleranceWindow	Indirect	The time window associated with the ToleranceMode, if any. If positive, the window shall be centered on the given reference time. If negative, the window shall end at the given reference time. Optional. This is an Indirect type – the value starts with the 16 byte identifier of the actual type.

Note: if the actual type of the ToleranceWindow is Length, the size of the window shall be calculated using the edit rate of the `MobSlot` in which the DynamicMarker is contained. This is to match the semantics of the `SourceClip` class. In all other cases, the window shall be calculated in absolute terms

Note: the ASPA specification 1.00 does not provide any standard method to indicate the estimated error in a data value.

18.2 DynamicClip Class

The `DynamicClip` class containes a reference to the source of synchronous dynamic metadata defined by ASPA.

The `DynamicClip` class is a concrete subclass of `DynamicMarker`.

A `DynamicClip` may be used in place of a `DynamicMarker` to indicate the `SourceMob`, slot(s) and position from which the synchronous dynamic metadata value is obtained. If the `KLVData` property of the Component superclass is not present, the value must be obtained from the indicated source whenever it is required. Conversely, if the `KLVData` property is present, it shall contain a copy of the referenced synchronous dynamic metadata.

The `DynamicClip` class adds the following properties to `DynamicMarker`:

Property Name	Type	Explanation
SourceMobID	MobIDType	The `MobID` of the `SourceMob` from which the synchronous dynamic metadata is obtained. Optional. A distinguished value of 0 indicates that the source of the metadata is unknown. If this property is not present, the source slot refers to a track in the same Mob.
SourceSlotIDs	UInt32Array	The `SlotIDs` of the slot or slots in the `SourceMob` from which the synchronous dynamic metadata is obtained. Optional
SourceIndex	Indirect	The index of the dynamic metadata within the referenced source, using the type given. Optional. This is an Indirect type – the value starts with the 16 byte identifier of the actual type. Normally, this value will be the identifier of the `Position` type

Property Name	Type	Explanation
SourceSpecies	Indirect	The selectors of the elements from the source that are used in the referring MobSlot. All other elements from the SourceMob shall be ignored. Optional. This is an Indirect type – the value starts with the 16 byte identifier of the actual type.Normally, this value will be the identifier of the "ArrayOfAUID" type.

Notes: if the actual type of the SourceIndex is Position, the position in the SourceMob shall be calculated using the edit rate of the MobSlot in which the DynamicClip is contained. This is to match the semantics of the SourceClip class. In all other cases, the SourceIndex shall be calculated in the frame of reference of the SourceMob.

19 Support Classes for ASPA

(This chapter of the AAF Specification is presently intentionally unused, reserved for specifications of additional AAF Classes).

19.1 Geographic Area

The Class Geographic Area has the following properties:

Property Name	Type	Explanation
GeographicArea_ NorthWest	Geographic_ Coordinate	The NorthWest corner point of the area
GeographicArea_ SouthEast	Geographic_ Coordinate	The SouthEast corner point of the area
GeographicArea_ SourceDatum	String Optional	Code indicating the source datum from which the coordinates are measured, per DIGEST spec. Default value = "WGE" Other values: "NAR", "NAS"

19.2 Geographic Polygon

The Class Geographic Polygon has the following properties:

Property Name	Type	Explanation
GeographicPolygon_ Coords	Geographic_ Coordinate_ Array	The corner points of the polygon, in clockwise sequence
GeographicPolygon_ SourceDatum	String Optional	Code indicating the source datum from which the coordinates are measured, per DIGEST spec Default value = "WGE" Other values: "NAR", "NAS"

19.3 Geographic Quadrilateral Stream Class

The Class GeographicQuadrilateralStream is used to gather the position information for a single image or a sequence of images into a data structure that may be encoded as a single KLV packet.

The Class GeographicQuadrilateralStream contains a GeographicQuadrilateralStream_SourceDatum and a variable-length array of GeographicQuadrilaterals, all of which are measured from the same datum.

The Class GeographicQuadrilateralStream has the following properties:

Property Name	Type	Explanation
GeographicQuadrilateralStream_Quadrilaterals	Geographic_QuadrilateralArray	The area covered by each image in the sequence
GeographicQuadrilateralStream_SourceDatum	String Optional	Code indicating the source datum from which the coordinates are measured, per DIGEST spec Default value = "WGE" Other values: "NAR", "NAS"

19.4 UTCComponent Class

The Class UTCComponent is used to decribe an interval of clock time. UTCComponent is used in place of Timecode for synchronization of motion imagery and dynamic metadata that is not tied intimately to video recording frame rates.

UTCComponent has the following properties:

Property Name	Type	Explanation
StartUTC	UTCString	The clock time of the start of the time interval

20 Unused Chapter

This chapter of the AAF Specification is presently intentionally unused.

21 Data Types

The ASPA Profile adds the following Data Types to the AAF Specification:

21.1 Fix32Dec3

The Type Fix32Dec3 is used to represent a value with 3 decimal places. In ASPA files, geographic Latitude and Longitude are measured in 1/1000 of an arc-second and are represented as Fix32Dec3 values.

21.2 Geographic Coordinate

The Type Geographic Coordinate is a Record with two members: Latitude and Longitude, both of Type Fix32Dec3.

21.3 Geographic Coordinate Array

The Type Geographic Coordinate Array contains a variable-length array of Geographic Coordinates as used in a Geographic Polygon

21.4 ToleranceModeType

The type ToleranceModeType enumerates the mode of determining the reference time of a DynamicMarker. Allowed values are as follows:

Symbol	Value	Explanation
Estimated	0	The value at the given reference time is estimated, not using any known interpolation method.

Assumed	1	The data was observed and the time of observation is assumed to be as given. No analytical weight can be given to the observation time or the size of the Window - they are guesstimates. Any interpolation is suspect
Precise	2	The data was observed at the precise reference time given.
Window	3	The data was observed sometime within a window of time relative to the given reference time.
Interpolated	4	The data value is the interpolated value that would be expected at the given reference time, using the given InterpolationMethod over the actual data received in the given time Window relative to the given reference time.

21.5 Geographic Quadrilateral

The Type `Geographic Quadrilateral` contains an array of four `Geographic_Coordinates`, in the sequence Top Left, Top Right, Bottom Right, Bottom Left in sensor field of view, as used in a `Geographic Quadrilateral Array`.

21.6 Geographic Quadrilateral Array

The Type `Geographic Quadrilateral Array` contains a variable-length array of Geographic Quadrilaterals, as used in a `Geographic Quadrilateral Stream`

21.7 UTCString

The Type `UTCString` is a derived type based on `String`, contains a single GPS timestamp, formatted according to ISO 8601 with timezone specifier and a time resolution of 1 millisecond or better, as used in a `UTCComponent` class.

22 DataDefinitions

Note that the approved Data Definitions are changed in V1.1 compared with AAF V1.0.1.

The ASPA Profile extends the provisions of this chapter of the AAF Specification as follows:

22.1 DynamicMetadata

ASPA defines the label DynamicMetadata, which is registered in the SMPTE Labels Registry RP224 v7

22.2 SynchronousDynamicMetadata

ASPA defines the label SynchronousDynamicMetadata, which shall be registered in the MISB Registry

23 Extensible Enumerations

The ASPA Profile does not alter the provisions of this chapter of the AAF Specification in any way.

24 Operation Groups

The ASPA Profile does not alter the provisions of this chapter of the AAF Specification in any way.

25 Tutorial on Compositions

The ASPA Profile does not alter the provisions of this chapter of the AAF Specification in any way.

26 Tutorial on Describing Essence

The ASPA Profile does not alter the provisions of this chapter of the AAF Specification in any way.

27 MetaDefinitions

The ASPA Profile does not alter the provisions of this chapter of the AAF Specification in any way.

28 Extensions

The ASPA Profile does not alter the provisions of this chapter of the AAF Specification in any way.

29 Bibliography

The ASPA Profile does not alter the provisions of this chapter of the AAF Specification in any way.

30 Conventions

The ASPA Profile does not alter the provisions of this chapter of the AAF Specification in any way.

Annex A Previous Versions

This annex lists substantive changes from previous versions of the ASPA Profile.

Editorial Clarifications in Version V1.3

6.8 clarified that events may be `DynamicMarkers` or subclasses (such as `DynamicClip`)

17.8 clarified name of `LIDAR_Bounding_Rectangle`

17.9 clarified name of `LVSD_Bounding_Rectangle`

18.2 clarified semantics of `DynamicClip` to match AAF spec

Changes from Version 1.2

6.8 added provision for `SynchronousDynamicMetadata` slots

6.8 added provision for `Timecode` slots

16.9 added `LVSDDescriptor`

17.9 added `DM_Set_LVSD_`Layer

19.3 added `GeographicQuadrilateralStream` class

19.4 added `UTCComponent` class

20.3 added `SynchronousDynamicMetadata` label

21.5 added `GeographicQuadrilateral` type with coordinates in clockwise sequence starting top left

21.6 added `GeographicQuadrilateralArray` type

21.7 added `UTCString` type

Changes from Version 1.0

Added DM_Set_LAS_Layer and LidarDescriptor.

Added reference to MISB EG0602.

Added Duration property to DM_Set_MPEGKLV_Layer

Clarified SourceDatum property of Geographic Polygon and Rectangle and corrected examples to match DIGEST specification.

Added `Object_Country_Code` property to ASPA_DM_Set layer.

Added `Motion_Imagery_ID` property to DM_Set_MPEGKLV_layer.

Changes from Version 0.9

ASPA Profile V0.9 document created December 2004 with ASPA Browser version 2.5 RC1.

Changes from Version 0.8.2

ASPA Profile V0.8.2 is the document distributed August 21st, 2004

Updated references to AAF V1.1 and MXF: SMPTE 377M-2004.

6.5 to 6.9: change “Package” to “Mob” per AAF V1.1

6.8 described SourceMobs for external essence

7.10 inserted DescriptiveMarker

Reordered and renumber chapter 15 to correspond to AAF Specification V1.1 chapter 15. Inserted chapter 16, renumbered chapter 17 and 18, renumbered chapter 17 to 19.

16.1 RP217Descriptor: updated superclass name, updated properties,, updated Container label

16.5 SGMLDescriptor, 16.6 HTMLDescriptor: added intermediate abstract SGMLDescriptor superclass.

Added chapter 18 on DynamicMarkers and DynamicClips

Added section 21.4 on ToleranceMode type

22. Noted that AAF V1.1 changes DataDefinition values.

Changes from Version 0.8

ASPA Profile V0.8 corresponds to the document distributed up to April 8 2004.

The version numbers were updated for the following references: MISP V 2.3, MISB RP 102.2, MISB RP 104.3.

Country_Code_Method is constrained to have one of the following values: ISO-3166 Three Letter, ISO-3166 Two Letter, FIPS 10-4 Two Letter

Release Instructions now specify that Countries are separated by a space when multiple countries are listed.

NonUS_Classification-Country is now spelled Non_US_Classification_Country

Coordinate_System was removed from DM_Set_MPEGKLV_Layer and DM_Set_NITF_Layer. This element is now incorporated into GeographicArea and GeographicPolygon.

Remove Map_Datum_Used from DM_Set_MPEGKLV_Layer. This is in GeographicArea and GeographicPolygon.

Fix class and type names for section 17.1 & 17.2

Changes from Version 0.7

ASPA Profile V0.7 corresponds to the AAF-in-IPL prototype distributed up to February 2004.

In V0.7, ASPA-specific Classes, Properties and Types were identified with temporary UUIDs. In V0.8, all identifications change to SMPTE ULs, and are registered in the appropriate registries:

SMPTE Registry – RP210

SMPTE Registry – RP224

AAF Registry – AAF Association SDK V1.0.2 “AAFMetaDict.xls”

ASPA – “libaspaIDs.h”

In V0.7, ASPA files extended AAF by adding a property to `Identification`, named `KLVData`:

Property Name	Type	Explanation
KLVData	strong reference to KLVData	The KLVData shall include a Security Metadata Set (MISB RP-0102) which specifies the security metadata applicable to the file at the time the file was modified (as recorded in the `ModificationTime` property of the `Identification`. Required.

In V0.7, ASPA files carried Level 0 Metadata in the KLVData property of the Identification object.

In V0.7, ASPA files did not contain any lower-level Source Mobs (section 6.8)

In V0.7, ASPA Files carried DM_Set_MPEGKLVLayer::Bounding_Rectangle as a property of type String.

In V0.7, ASPA Files carried DM_Set_NITFLayer:: Geographic_Location as a property of type String.

In V0.7, level 1 Dynamic Metadata is derived only from the first top-level file Source Mob, and only from the first image layer within an NITF file.